Letters to the Editor

The Editor welcomes submissions for possible publication in the Letters to the Editor section that consist of commentary on an article published in the Journal or other relevant issues. Authors should:

- Include no more than 500 words of text, three authors, and five references
- Type with double-spacing
- See http://jtcs.ctsnetjournals.org/misc/ifora.shtml for detailed submission instructions.
- Submit the letter electronically via jtcvs.editorialmanager.com.

Letters commenting on an article published in the JTCVS will be considered if they are received within 6 weeks of the time the article was published. Authors of the article being commented on will be given an opportunity to offer a timely response (2 weeks) to the letter. Authors of letters will be notified that the letter has been received. Unpublished letters cannot be returned.

Global statistics/outcomes

To the Editor:

The recent article by Ribeiro and associates[1] and the related editorial by David[2] merit further comment and discussion. Clearly, globalization and the Internet, especially The Cardiothoracic Surgery Network, have brought the cardiothoracic surgery community closer together. It was only a matter of time before the results of cardiac surgery in developing countries or emerging economies would be voluntarily reported. The authors are correct in that the reports are scanty regarding worldwide results in cardiac surgery. Yes, we want to know the global statistics, but there is no international or national body presently willing and able to extract and gather this information, certainly on a voluntary basis. Small and large programs in these countries are hesitant to report their results, for fears both imagined and unimagined. Rather than go through the evolutionary torture chamber of the developed countries' database and reporting systems, we should establish a voluntary system that would offer interested international programs a system that fixes the problem, and not the blame. The Northern New England Cardiovascular Disease Study Group database program is one example to study and modify for developing/emerging programs.[3] The international database plan of the European Association for Cardiothoracic Surgery was started but, to my knowledge, has not been developed or reported in recent years.[4] Only with an international database containing the global number of programs, surgeons, caseloads, and outcomes can we even begin to develop logical strategies and offer valid suggestions and recommendations to those programs and countries that are courageous, honest, and willing to share their results. At the present time, global statistics regarding number of programs, cardiothoracic surgeons, annual caseloads, and results are extracted from occasional reports like this one, the Unger report,[5] personal communications, and corporate privatory information. Hospital volume is only one variable that should be looked at. Other variables including age, complexity, comorbidity, mortality, morbidity, and long-term results are also important, but surgical training and institutional support facilities, especially with regard to access to care and waiting lists, need to be analyzed and addressed as well. Any recommendations offered must balance the results in developed and emerging programs to meet international guidelines or recommendations, and not standards or requirements. That will evolve over time. Let's get everyone into the boat, going in the same direction, and then decide who sits where and who does what! The authors should be praised for their efforts, and other groups and centers in emerging economies or developing countries should be encouraged to present similar reports and studies.

A. Thomas Pezzella MD
Director, Special Projects
World Heart Foundation
Attending Cardiothoracic Surgeon
Shanghai Chest Hospital
Shanghai, China

References

1. Ribeiro ALP, Gagliardi SPL, Nogueira JLS, Silveira LM, Colosimo EA, Lopes do Nascimento CA. Mortality related to cardiac surgery in Brazil, 2000-2003. *J Thorac Cardiovasc Surg*. 2006;131:907-9.
2. David TE. Should cardiac surgery be performed in low-volume hospitals? *J Thorac Cardiovasc Surg*. 2006;131:773-4.
3. Northern New England Cardiovascular Disease Study Group (NNECDSG). Available from: http://www.nnecdsg.org.
4. Wyse RKH, Taylor KM. The development of an international surgical registry: the ECSUR project. The European Cardiac Surgical Registry. *Eur J Cardiothorac Surg*. 1999;16:2-8.
5. Unger F. Worldwide survey on cardiac interventions 1995. *Cor Europaeum.* 1999;7:128-46.

doi:10.1016/j.jtcvs.2006.05.009

The effect of aortic valve replacement on coronary flow reserve

To the Editor:

We read with great interest and congratulate Bakhtiary and colleagues[1] on the study

entitled "Stentless Bioprostheses Improve Postoperative Coronary Flow More Than Stented Prostheses After Valve Replacement for Aortic Stenosis." This intriguing magnetic resonance imaging study found that patients receiving stentless valves showed a normal coronary flow reserve (CFR) 6 months after aortic valve replacement (AVR), whereas those receiving stented valves demonstrated a slightly reduced CFR. However, we feel that a few additional comments are necessary.

In recent echocardiographic studies, reduced CFR has been demonstrated in aortic stenosis (AS) patients regardless of the presence or absence of coronary artery disease.[2-6] We found a CFR improvement in AS patients 15 months after AVR with mechanical valves.[4] This CFR improvement paralleled the regression of left ventricular hypertrophy. However, CFR did not reach normal values, thus suggesting that other factors also play a role in CFR impairment in AS. This has been strengthened by our more recent findings that CFR improvement 3 years after AVR was transient despite unchanged left ventricular mass.[5]

Overall, these results suggest that AVR with mechanical valves is associated with coronary microvascular functional alterations. Further studies in larger AS populations are warranted using more reliable techniques for CFR evaluation (such as magnetic resonance imaging) to verify our disappointing long-term results. Also, potential differences between different kinds of mechanical valves and bioprostheses should be investigated to identify the optimal therapy for coronary circulation.

Attila Nemes, MD, PhD, FESC[a,b]
Tamás Forster, MD, PhD, DSc, FESC[a]
Marcel L. Geleijnse, MD, PhD[b]
Folkert J. ten Cate, MD, PhD, FESC, FACC[b]
Miklós Csanády, MD, PhD, DSc, FESC, FACC[a]
Second Department of Medicine and Cardiology Center
Medical Faculty
Albert Szent-Györgyi Medical and Pharmaceutical Center
University of Szeged[a]
Szeged, Hungary
Department of Cardiology
Thoraxcentre
Erasmus MC[b]
Rotterdam, The Netherlands

References

1. Bakhtiary F, Schiemann M, Dzemali O, Wittlinger T, Doss M, Ackermann H, et al. Stentless bioprostheses improve postoperative coronary flow more than stented prostheses after valve replacement for aortic stenosis. *J Thorac Cardiovasc Surg.* 2006;131:883-8.
2. Nemes A, Forster T, Varga A, Vass A, Borthaiser A, Palinkas A, et al. How can coronary flow reserve be altered by severe aortic stenosis? *Echocardiography.* 2002;19:655-9.
3. Nemes A, Forster T, Thury A, Kovacs Z, Boda K, Csanady M. The comparative value of the aortic atherosclerosis and the coronary flow velocity reserve evaluated by stress transesophageal echocardiography in the prediction of patients with aortic stenosis with coronary artery disease. *Int J Cardiovasc Imaging.* 2003;19:371-6.
4. Nemes A, Forster T, Kovacs Z, Thury A, Ungi I, Csanady M. The effect of aortic valve replacement on coronary flow reserve in patients with a normal coronary angiogram. *Herz.* 2002;27:780-4.
5. Nemes A, Forster T, Kovacs Z, Csanady M. Is the coronary flow velocity reserve improvement after aortic valve replacement for aortic stenosis transient? Results of a 3-year follow-up. *Heart Vessels.* 2006;21:157-61.
6. Nemes A, Forster T, Csanady M. Decreased aortic distensibility and coronary flow velocity reserve in patients with significant aortic valve stenosis with normal epicardial coronary arteries. *J Heart Valve Dis.* 2004;13:567-73.

doi:10.1016/j.jtcvs.2006.04.035

Reply to the Editor:

We appreciate the comments of Nemes and associates regarding our recent article and would like to point out the following issues in response to their comments.

The current published clinical trial followed our previous animal studies,[1,2] in which we investigated the effects of valve design and orientation on acute changes of coronary flow in different mechanical valve substitutes and the native aortic valve. In the group in which we did not replace the aortic valve but only performed 90 minutes of extracorporeal circulation and 60 minutes of myocardial ischemia, coronary flow rates increased significantly. No mechanical aortic valve could achieve this reactive hyperemia, with superior results for the Medtronic Hall and Advantage valves compared with the St Jude standard bileaflet valve. Coronary flow rates depended not only on valve design, but also on valve orientation; the previously defined optimal orientations with respect to hemodynamics also provided the highest coronary artery flow. We explained these findings by lower intraventricular diastolic pressures and reduced levels of aortic root turbulence in the optimal orientations.

In the recent study, our patients had no history of coronary artery disease, but angina pectoris was present in more than 50%. The improvement of coronary flow reserve (CFR) in the stentless group was independent of the left ventricular mass regression. However, we observed a trend toward accelerated regression of left ventricular mass regression in the stentless group, without any statistical significance ($P = .06$).

We share the opinion that aortic valve design has a significant influence on improvement of CFR after prosthetic aortic valve replacement. The increased long-term mortality described in recent studies in patients with severe aortic valve disease after aortic valve replacement[3,4] compared with the normal population could be partially caused by these findings. Therefore, CFR should be included if in vivo hemodynamic performance of prosthetic aortic valves is investigated.

Regarding the optimal clinical method for measurement of CFR, we agree with Nemes and colleagues that magnetic resonance imaging can provide more objective results compared with echocardiography; conversely, the echocardiography method is less complex and easier to perform. We have just completed a retrospective study on 20 aortic valve patients (Advantage, n = 10; St Jude Medical, n = 10; interval from the operation, >6 months). Echocardiographic measurement of CFR (adenosine 140 $\mu g \cdot kg^{-1} \cdot min^{-1}$ over 7 minutes) was possible in 17 patients (85%). Normal CFR was demonstrated in only three Advantage patients (Table 1). Because this was not a randomized study, we have not yet published these data, but we have initiated a randomized clinical multicenter study with echocardiographic measurement of CFR between the two bileaflet mechanical valve substitutes with large patient numbers to investigate chronic changes of CFR after mechanical aortic valve replacement.

Farhad Bakhtiary, MD
Omer Dzemali, MD
Thomas Wittlinger, MD
Anton Moritz, MD
Peter Kleine, MD
Department of Thoracic and Cardiovascular Surgery
Johann Wolfgang Goethe University
Frankfurt am Main, Germany